

REMARKS

As per Applicant's representative's telephonic message of March 20, 2006, Applicant respectfully requests the grant of a telephonic interview to discuss the merits of the outstanding Amendment, and any further proposed amendments, for expediting prosecution of this case.

Summary of the Office Action

In the Office Action, claim 15 has been objected to for a minor informality.

Claims 1-4, 6-9, 11, 12, 14-19, 21, 22, 24, 25 and 27 stand rejected under 35 U.S.C. § 102 (e), as being anticipated by U.S. Patent No. 6,463,121 to *Milnes*.

Claims 10, 13, 23 and 26 stand rejected under 35 U.S.C. § 103 (a), as being unpatentable over *Milnes* in view of U.S. Patent No. 6,233,310 to *Relihan*.

Summary of the Response to the Office Action

Applicant proposes amending claims 1, 15 and 16. Accordingly, claims 1-4, 6-19 and 21-29 are pending for further consideration.

Objection to the Claims

In the Office Action, claim 15 has been objected to for a minor informality.

With regard to claim 15, Applicant proposes amending claim 15 as noted above.

Accordingly, Applicant respectfully requests withdrawal of the objection to claim 15.

All Claims are Allowable

In the Office Action, claims 1-4, 6-9, 11, 12, 14-19, 21, 22, 24, 25 and 27 stand rejected under 35 U.S.C. § 102 (e), as being anticipated by U.S. Patent No. 6,463,121 to *Milnes*. Claims 10, 13, 23 and 26 stand rejected under 35 U.S.C. § 103 (a), as being unpatentable over *Milnes* in view of U.S. Patent No. 6,233,310 to *Relihan*. Applicant traverses the rejection of claims 1-4, 6-19 and 21-29 for the following reasons.

With regard to independent claim 1, Applicant respectfully asserts that *Milnes* and *Relihan*, viewed either singly or in combination, fail to teach or fairly suggest a system for positioning a dental X-ray apparatus, wherein, "the dental X-ray apparatus is controllable by said control data such that the selected area is covered when a new dental X-ray image is made, and wherein the information concerning the X-ray apparatus comprises coordinates of a trajectory which have been saved in relation to the digitized X-ray image, wherein the digitized dental X-ray image is a panoramic image, and wherein the trajectory gives knowledge of movement of the dental X-ray apparatus carried out at a certain point of time," as recited in independent claim 1, as amended.

Support for these features recited in claim 1 can be found at least on page 2, line 14 to page 5, line 9, and further on page 5, line 25 to page 7, line 9 of the originally filed specification, and in Figs. 1-3 of the originally filed drawings. Specifically, as shown in Figs. 1-3, the present invention provides a system for positioning a dental X-ray apparatus. The system includes an input and output device (i.e. a keyboard and a display monitor) for interactive control.

The system further includes a storage area, in which at least one digitized dental X-ray image and information concerning the dental X-ray apparatus assignable to the digitized dental X-ray image are stored. This information concerning the X-ray apparatus preferably relates to position parameters of the movable parts. Thus a certain area of an X-ray image can be associated with the corresponding parameters of the X-ray apparatus. Vice versa, the X-ray apparatus can be controlled by the X-ray image.

The system further includes a computer interface, via which information can be interchanged with the dental X-ray apparatus, and means (i.e. a pointing device) for selecting areas in the digitized dental X-ray image. The system also includes a processing unit which effects calculations based on the digitized dental X-ray image, the relevant information concerning the dental X-ray apparatus, and the selected area, in order to ascertain control data for the dental X-ray apparatus. These calculations are preferably based on the path information, which has been assigned to the imaging information. The path information gives knowledge of the movement of the X-ray apparatus carried out at a certain point of time. Thus the coordinates

of the X-ray apparatus are given in relation to a certain point of time. Based upon the features described above, the dental X-ray apparatus is controllable by the control data such that the selected area is covered when a new dental X-ray image is made. Further, the information concerning the X-ray apparatus includes coordinates of a trajectory which have been saved in relation to the digitized X-ray image. As recited in independent claim 1 and illustrated in Figs. 2 and 3, the digitized dental X-ray image is a panoramic image, and the trajectory gives knowledge of movement of the dental X-ray apparatus carried out at a certain point of time (see page 3, lines 1-8).

With regard to claims 1-4, 6-19 and 21-29, the Office Action cites *Milnes* as teaching or suggesting the system and method recited in claims 1-4, 6-9, 11, 12, 14-19, 21, 22, 24, 25 and 27, and further cites *Relihan* as teaching or suggesting the system and method recited in claims 10, 13, 23 and 26.

Milnes, as illustrated in Figs. 1-8 (especially Figs. 1 and 2) thereof, discloses an X-ray system 100 and method including a display device 110, a gantry 130 having an X-ray generator 132, a table 140 having an X-ray sensor 142, and an X-ray control system 120 connected to the display device, the gantry and the table, (Col. 3:32-37). The X-ray control system includes user input 122 for indicating the position of the next X-ray exposure, (Col. 3:47-48). The X-ray control system receives X-ray data from the sensor, processes the data to form a static X-ray image, displays the X-ray image on the display device and shifts the X-ray generator relative to the X-ray sensor, (Col. 3:65 – Col. 4:9). The amount and direction of shift is accurately determined using data from the previous static X-ray image, (Col. 2:1-3 and Col. 7:1-4). Further, as discussed in Col. 5:43-56 of *Milnes*, the *Milnes* X-ray control system 120 automatically follows a tip of a catheter or a contrast injected into a body in order to reduce the number, size and duration of the static X-ray images. The catheter tip and the contrast injected into a body may move on a trajectory.

Contrary to the recitation in independent claim 1 of the present invention (as now amended), *Milnes* clearly does not teach or fairly suggest a dental X-ray apparatus, wherein, “the information concerning the X-ray apparatus comprises coordinates of a trajectory which have

been saved in relation to the digitized X-ray image, wherein the digitized dental X-ray image is a panoramic image, and wherein the trajectory gives knowledge of movement of the dental X-ray apparatus carried out at a certain point of time,” as recited in independent claim 1, as amended.

Specifically, contrary to the teachings of *Milnes*, Claim 1, as amended per the October 6, 2005 Amendment, recited that the information concerning the X-ray apparatus includes coordinates of a trajectory which have been saved in relation to the digitized X-ray image. This means that the X-ray apparatus must have been moving relative to the object to be X-rayed during acquisition. This further means that information is saved of how the X-ray apparatus has moved during the acquisition of the image already stored in the storage area in order to ascertain control data for steering the X-Ray apparatus to make it cover the selected area (for the next image), as discussed on page 3, lines 1-4 of the description.

On the contrary, as discussed in Col. 5:43-56 of *Milnes*, the *Milnes* X-ray control system 120 automatically follows a tip of a catheter or a contrast injected into a body in order to reduce the number, size and duration of the X-ray images. The catheter tip and the contrast injected into a body may move on a trajectory.

In other words, *Milnes* does not disclose that the information about the trajectory is stored, because *Milnes* does not disclose movement of the X-ray apparatus relative to the object to be X-rayed in the image already stored in the storage area at all. The X-ray control system just follows a tip or a contrast in the recent exposure.

Thus Applicant respectfully asserts that *Milnes* clearly does not teach or fairly suggest a dental X-ray apparatus, wherein, “the information concerning the X-ray apparatus comprises coordinates of a trajectory which have been saved in relation to the digitized X-ray image,” as recited in independent claim 1, as amended.

As noted above, in the interest of expediting prosecution of this application, claim 1 has been further amended to now recite, “wherein the digitized dental X-ray image is a panoramic image, and wherein the trajectory gives knowledge of movement of the dental X-ray apparatus carried out at a certain point of time.”

With regard to the teachings of *Milnes*, Applicant respectfully asserts that *Milnes* also does not teach or fairly suggest the noted features of independent claim 1, as now amended, namely the use of a dental panoramic X-ray image or a trajectory giving knowledge of movement of the X-ray apparatus carried out at a certain point of time.

Specifically, compared to the static image acquisition disclosed in *Milnes*, a panoramic image is based on a movement of the X-ray device relative to the patient. Hence, since *Milnes* discloses the use of static image acquisition, *Milnes* provides no teaching whatsoever for a trajectory giving knowledge of movement of the X-ray apparatus carried out at a certain point of time.

For example, while calculating the shift of the X-ray equipment based on a static acquired (and flat) image only needs to take into account the RELATIVE position of the new center of interest to the displayed image, a panoramic image on the other hand is acquired with the X-ray equipment moving on a curved trajectory. Therefore, the ABSOLUTE position of the X-Ray equipment at each moment of image acquisition must be known. Since furthermore the trajectory may depend on the patient, the trajectory may be different for each digitized dental X-ray image. In this regard, the benefits of the present invention in use of a panoramic image become readily apparent as a child would likely have a much narrower jaw than that of an adult, or even adults may have jaws of different sizes. The present invention thus allows for these different jaw sizes to be taken into account while preparing the X-ray device.

Thus the mode of X-ray acquisition for the present invention is completely different than that disclosed by *Milnes*.

Yet further, the X-ray image disclosed in *Milnes* is taken in a single shot while the acquisition of a dental panoramic image as disclosed in the present invention application demands making multiple images from different positions and combining them to a single image.

Thus based at least on the distinctions specified above and the further amendments to claim 1, Applicant respectfully asserts that *Milnes* fails to teach or fairly suggest a system for positioning a dental X-ray apparatus, wherein, "the digitized dental X-ray image is a panoramic

image, and wherein the trajectory gives knowledge of movement of the dental X-ray apparatus carried out at a certain point of time,” as recited in independent claim 1, as amended.

Yet further, as discussed in the response filed April 18, 2005, Applicant also respectfully maintains and re-emphasizes that contrary to the recitation in independent claim 1 of the present invention, *Milnes* clearly does not teach or fairly suggest a dental X-ray apparatus, including, “a storage area, in which at least one digitized dental X-ray image and information concerning the dental X-ray apparatus assignable to the digitized dental X-ray image are stored ... a processing unit which effects calculations based on the digitized dental X-ray image, the relevant information concerning the dental X-ray apparatus, and the selected area, in order to ascertain control data for the dental X-ray apparatus ... wherein the dental X-ray apparatus is controllable by said control data such that the selected area is covered when a new dental X-ray image is made, and wherein the information concerning the X-ray apparatus comprises coordinates of a trajectory which have been saved in relation to the digitized X-ray image, wherein the digitized dental X-ray image is a panoramic image, and wherein the trajectory gives knowledge of movement of the dental X-ray apparatus carried out at a certain point of time,” as recited in independent claim 1, as amended.

Specifically, as discussed in the response filed April 18, 2005, whereas *Milnes* discloses the use of data from the previous X-ray image for determining the amount and direction of shift of the X-ray generator relative to the X-ray sensor (see Col. 2:1-3 and Col. 7:1-4 of *Milnes*), *Milnes* clearly does not disclose the storage and/or use of information concerning the dental X-ray apparatus assignable to the digitized dental X-ray image.

As discussed above for the present invention, the present invention X-ray system includes a storage area, in which at least one digitized dental X-ray image and information concerning the dental X-ray apparatus assignable to the digitized dental X-ray image are stored. This information concerning the X-ray apparatus preferably relates to position parameters of the movable parts. Thus a certain area of an X-ray image can be associated with the corresponding parameters of the X-ray apparatus. Vice versa, the X-ray apparatus can be controlled by the X-ray image.

Milnes simply teaches no such storage or use of information concerning the dental X-ray apparatus assignable to the digitized dental X-ray image.

Further, as exemplified by the discussion in Col. 5:42-55 of *Milnes*:

“Image processor 725 generates images 701 based on the data received from image acquisition system 730 and displays the images on its display. An operator selects a location within the image shown on the display and the information regarding the selected location is transferred to system controller 710. System controller 710 processes the information received from the operator and instructs positioner 720 as to the desired positioning of the patient relative to the X-ray source.”

Thus, as emphasized above, *Milnes* clearly does not disclose the storage and/or use of information concerning the dental X-ray apparatus assignable to the digitized dental X-ray image.

As discussed in the present invention specification, by using information concerning the dental X-ray apparatus assignable to the digitized dental X-ray image, and controlling the X-ray apparatus based upon such information, a user is able to ascertain movement of the X-ray apparatus carried out at a certain point of time. Thus the coordinates of the X-ray apparatus are given in relation to a certain point of time, (see page 3, lines 1-8 of the present invention specification). The knowledge of the X-ray apparatus coordinates in relation to the X-ray image make it possible to obtain X-ray images of details in a more efficient manner, as compared to the conventional X-ray apparatus of *Milnes*.

Therefore, based upon the aforementioned deficiencies in the teachings of *Milnes*, Applicant respectfully asserts that *Milnes* fails to teach or fairly suggest a system for positioning a dental X-ray apparatus, as now recited in independent claim 1 (as amended), including, “a storage area, in which at least one digitized dental X-ray image and information concerning the dental X-ray apparatus assignable to the digitized dental X-ray image are stored ... a processing unit which effects calculations based on the digitized dental X-ray image, the relevant information concerning the dental X-ray apparatus, and the selected area, in order to ascertain control data for the dental X-ray apparatus ... wherein the dental X-ray apparatus is controllable

by said control data such that the selected area is covered when a new dental X-ray image is made, and wherein the information concerning the X-ray apparatus comprises coordinates of a trajectory which have been saved in relation to the digitized X-ray image, wherein the digitized dental X-ray image is a panoramic image, and wherein the trajectory gives knowledge of movement of the dental X-ray apparatus carried out at a certain point of time,” as recited in independent claim 1, as amended.

With regard to the teachings of *Relihan*, which has been cited as teaching or suggesting the features or steps recited in dependent claims 10, 13, 23 and 26, Applicant respectfully asserts that in view of the requested allowance of independent claim 1 over the teachings of *Milnes*, the teachings of *Relihan* as applied to dependent claims 10, 13, 23 and 26 would be inapplicable upon allowance of independent claim 1.

As pointed out in MPEP § 2131, “[t]o anticipate a claim, the reference must teach every element of the claim.” “A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros. v. Union Oil Co. Of California*, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987). Moreover, as pointed out in M.P.E.P. § 2143.03, “[t]o establish prima facie obviousness of a claimed invention, all the claimed limitations must be taught or suggested by the prior art”. *In re Royka*, 409 F.2d 981, 180 USPQ 580 (CCPA 1974). Since these criteria have not been met, Applicant respectfully asserts that the rejections under 35 U.S.C. § 102 (e) and § 103 (a) should be withdrawn because *Milnes* and *Relihan* do not teach or suggest each feature of independent claim 1, as amended.

In view of the above arguments, Applicant respectfully requests the rejection of independent claim 1 under 35 U.S.C. § 102 be withdrawn. Additionally, claims 2-15 and 28, which depend from independent claim 1, are allowable at least because their base claim is allowable, as well as for the additional features recited therein.

Independent claim 16

With regard to independent claim 16, Applicant respectfully asserts that *Milnes* and *Relihan* fail to teach or fairly suggest a method of positioning one of an emitter and a detector of a dental X-ray apparatus using an existing digitized dental X-ray image and information concerning the dental X-ray apparatus and assignable to the digitized dental X-ray image, the method including the steps of, “loading and displaying at least one digitized dental X-ray image ... determining coordinates of areas, with reference to the digitized dental X-ray image, which are to be depicted in another X-ray image ... loading information concerning the dental X-ray apparatus ... carrying out computation on the basis of the digitized X-ray image, relevant information concerning the dental X-ray apparatus, and a selected area, in order to ascertain control data which controls the dental X-ray apparatus such that the selected area can be depicted in a new dental X-ray image, wherein the information concerning the X-ray apparatus comprises coordinates of the trajectory which have been saved in relation to the digitized X-ray image, and a segment of the trajectory is calculated on the basis of the selected area, wherein the digitized dental X-ray image is a panoramic image, and wherein the trajectory gives knowledge of movement of the dental X-ray apparatus carried out at a certain point of time,” as recited in independent claim 16, as amended.

Applicant respectfully asserts that independent claim 16 is allowable for at least the reasons presented above for the allowance of independent claim 1, and the additional features recited therein. In the interest of avoiding redundant arguments, the reasons for allowance of independent claim 16 are not repeated herein. Additionally, claims 17-27 and 29, which depend from independent claim 16, are allowable at least because their base claim is allowable, as well as for the additional features recited therein.

CONCLUSION

In view of the foregoing, Applicant respectfully requests the entry of this Amendment to place the application in clear condition for allowance or, in the alternative, in better form for appeal. Applicant also requests the Examiner’s reconsideration and reexamination of the

application and the timely allowance of the pending claims. Should the Examiner feel that there are any issues outstanding after consideration of this response, the Examiner is invited to contact Applicant's undersigned representative to expedite prosecution.

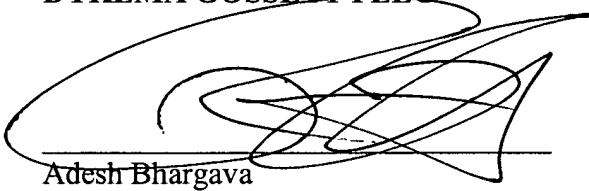
If there are any other fees due in connection with the filing of this response, please charge the fees to our Deposit Account No. 04-2223. If a fee is required for an extension of time under 37 C.F.R. § 1.136 not accounted for above, such an extension is requested and the fee should also be charged to our Deposit Account.

Respectfully submitted,

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